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NF94-162 Clostridium botulinum

Susan S. Sumner

Julie A. Albrecht

University of Nebraska--Lincoln, jalbrecht1@unl.edu

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NebFact



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Clostridium botulinum

By Susan S. Sumner, Extension Food Microbiologist
Julie A. Albrecht, Extension Food Specialist

- The Disease:** A toxin produced by the bacteria, *Clostridium botulinum*, can result in a disease called botulism. This toxin is called a neurotoxin because it affects the nervous system. Symptoms appear 12 to 48 hours after eating a food which contains the toxin. The symptoms include double vision, droopy eyelids, trouble with speaking and swallowing and difficulty with breathing. Without treatment death may result from suffocation because the nerves can no longer stimulate breathing. Antitoxins have been used to reduce the fatality rate of the disease but persons may recover slowly and suffer from nerve damage.
- The Organism:** The bacteria, *Clostridium botulinum*, is anaerobic — it only grows where there is little or no oxygen. This bacteria can exist as a vegetative cell or a spore. The spore is the dormant state of the cell and can exist under conditions where the vegetative cell cannot. When the conditions are right, the spore will grow into the vegetative cell. When the vegetative cells grow to high numbers, this bacteria produces the toxin. The vegetative cells of this bacteria are destroyed by heat but the spore is very resistant to heat. The bacteria and the spore also are inhibited from growing in acid environments (pH 4.6 or below).
- Sources:** *Clostridium botulinum* bacteria are present in the soil and water. Spores can be associated with any food that comes into contact with the soil or grows in water. Improperly home canned low-acid foods (vegetables, meat, poultry, fish) are usually the cause of a botulism foodborne illness. During the canning process, oxygen is removed from the container and if the proper temperatures to destroy the spores are not reached, the spores now have the proper environment to grow into vegetative cells and eventually produce the deadly toxin.
- Control:** Proper canning methods must be used for preserving low-acid foods. Pressure processing is necessary to obtain the temperatures required to destroy the *Clostridium botulinum* spore. The toxin can be destroyed by boiling for 10 minutes at sea level (add 1 minute for every 1,000 feet above sea level). When the bacteria grows, it can produce a gas which causes canned items to bulge. Never taste food from leaking, bulging, or damaged cans;

from cracked jars or with loose or bulging lids; from containers that spurt liquid when opened; or any canned food that has an abnormal odor or appearance. Discard any suspected canned foods by placing the container in a heavy garbage bag marked "POISON" and place the bag in a trash container that is not accessible to people, children or animals. Clean all surfaces that leaky containers may have contaminated with a chlorine/water solution (one tablespoon chlorine per gallon of warm water). Discard any sponges or cloths used for cleanup.

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